

Appendix C

Operational Checklists and Logs

Dynamic Underground Stripping Electrical Heating Start of Operations Checklist

	Date_____	Technician_____	Initial
1.	Verify that main circuit breaker is locked out.		_____
2.	Walk the perimeter fence and verify that <u>no</u> metal conductors (ERT cables, TC wires, pipes, etc.) are crossing the fence line.		_____
3.	Verify that there is no standing water in the electrical heating well Christy boxes. Pump dry if necessary.		_____
4.	Verify that the low voltage circuit breakers (the panel inside the fence) are in the open position.		_____
5.	Verify that the north and west perimeter gates are closed. Visually inspect the gate interlock switches to confirm closure.		_____
6.	Exit the controlled area through the man gate on west side next to Trailer 4107. Visually inspect the gate interlock switches to confirm closure.		_____
7.	Remove the lockout from the circuit breaker.		_____
8.	Energize the control panel. Using the remote switch located on the control panel, close the main circuit breaker.		_____
9.	Verify that the emergency kill switch mounted on the control panel will open the breaker. Close the breaker using the remote switch and repeat the test for all three gate interlocks. Record results on the Interlock Maintenance Log.		_____
10.	Post project personnel at the corners of the controlled area (outside the access control fence) such that the entire fence line is observable. Observers are there to ensure that nobody approaches the fence line until voltage measurements can be taken to verify that it is not energized. Observers are not to touch the fence. Observers must be wearing electrical hazard safety shoes.		_____
11.	Open the main circuit breaker, turn off control power, and lock out the main breaker.		_____

12. Enter the controlled area and set the appropriate low voltage breakers in the closed position according to the Electrical Heating Well Configuration Log. _____
13. Exit the controlled area through the man gate next to T-4107. Visually inspect the gate interlock switch to confirm closure. _____
14. Remove the lockout from the circuit breaker. _____
15. Notify Security at 2-7225 and Fire Dispatch at 2-7595 that electrical heating operations are about to begin. _____
16. Notify project personnel that the pattern is about to be energized. _____
17. Energize the pattern. _____
18. Project personnel, with the appropriate protective clothing and training as specified in OSP L-52, will conduct a voltage survey of the perimeter fence, nearby structures, buildings, etc. Measurements will be recorded. _____
19. A potential difference of 10 VAC or greater is considered to be a shock hazard and must be eliminated per OSP L-52. _____
20. At the conclusion of testing open the main circuit breaker from the control panel, lock out the breaker (note lock out in the Lockout/Tagout record) and turn control power off. _____

NES92-384 11-4-92

Electrical Heating Electrode Amperage Log

Technician Initial: _____

Date: _____

[illegible]

Technician Guidelines for Electrical Heating Operations

1. All technicians monitoring electrical heating operations must have read and be familiar with OSP L-52. Copies are posted in T-4107.
2. Wells to be energized will be specified nightly by Mike Buettner on the *Well Configuration Log*.
3. Prior to beginning electrical heating, the *Pre-electrical Heating Checklist* must be completed.
4. Lock and Tag procedures will be used any time it is necessary to go inside the fence. (The main breaker must be locked in the open position). No one is allowed inside the fence with power on.
5. Technicians will be responsible for maintaining a written *Amperage Log* on an hourly basis, in addition to their normal TFF logs.
6. On those occasions when it is necessary to wet the electrical heating wells, the *Well Wetting Checklist* must be followed.
7. At the conclusion of electrical heating the *Post Electrical Heating Checklist* must be completed.
8. For TFF system failures or alarms, shut off electrical heating power and lock and tag the main breaker prior to entry into the pattern.
9. If the current to the following wells exceeds 300 amperes, shut the power off to all wells and call Mike Buettner (443-9666) or Bill Siegel (447-5404) for directions on how to proceed:
 - HW-001 deep and shallow
 - HW-002 deep and shallow
 - HW-003 deep and shallow
 - GIW-814
 - GIW-815
10. If the temperature in any well exceeds 800°, shut the power off to all wells and call Mike Buettner (443-9666) or Bill Siegel (447-5404) for directions on how to proceed.
11. If the current level drops by 50% from the original values (when the shift started) begin wetting the well. Follow the *Well Wetting Procedure*.

Pre-electrical Heating Checklist

Date_____	Technician_____	Initial
1. The responsible individual will out the Electrical Heating Well Configuration Log indicating the voltage setting, and the phase setting for the energized wells.		_____
2. Verify that the main circuit breaker is locked out.		_____
3. Walk the perimeter fence and verify that no metal conductors (ERT cables, TC wires, pipes, etc.) are crossing the fence line and that no other personnel are present in the area. Check inside B-406 and adjacent buildings to verify that no personnel are present.		_____
4. Verify that the north and west perimeter gates are closed Visually inspect the gate interlock switches to confirm closure. Place the "Enter through T-4107 Only" signs on the north and east perimeter gates.		_____
5. Confirm that there is no standing water in the Christy boxes of the wells to be energized. (Wells to be energized are specified in the Well Configuration Log). If there is water in the boxes remove it prior to the start of electrical heating.		_____
6. Verify that steam hoses have not been connected to the steam injection well heads. Verify that instrumentation power to the data acquisition system at each well head is on.		_____
7. Set well breaker switches (low voltage panel) to the ON position as specified on the Well Configuration Log. Verify that all other breakers are in the OFF position.		_____
8. Exit the controlled area through the man gate on west side next to Trailer 4107. Visually inspect the gate interlock switches to confirm closure.		_____
9. Remove lockout from the main circuit breaker. Note removal of lockout on the Lockout/Tagout Record.		_____
10. Notify Security at 2-7225 that ground heating operations are about to begin.		_____
11. Energize the pattern from the remote switch inside Trailer 4107.		_____
12. From outside the perimeter fence, verify that the rotating beacons located at each perimeter gate are working.		_____

13. Note amperage levels for each energized well at the beginning of heating and at once per hour thereafter. If the amperage levels for any well are more than 80% less than the other wells, proceed to "Electrical Heating-Well Wetting" checklist. _____
14. At the conclusion of electrical heating, de-energize the well heads by shutting off power at the main circuit breaker via the control panel inside Trailer 4107. _____
15. Complete the Post-Electrical Heating Checklist. _____

NES92-385 11-3-93

Dynamic Underground Stripping Post-electrical Heating Checklist

Date_____ Technician_____ Initial_____

1. Shut off power to the wells using the remote switch located in Trailer 4107. _____
2. Notify Security at 2-7225 that electrical heating operations have concluded for the day. _____
3. Verify that main circuit breaker is locked out. Record lockout of the main circuit breaker on the Lockout/Tagout Log. _____
4. Enter the controlled area and open the switches (the OFF position) in the low voltage switch panel. Record lockout of circuit breaker in the Lockout/Tagout Log. _____
5. Inspect electrical heating well heads and power cable for signs of damage, overheating etc. Notify the Site Safety Manager of irregularities. Record any problems below. _____
6. Open the area for general access by project personnel. _____

Additional Reporting:

NES92-387 11-12-92

Electrical Heating Well Wetting Checklist

Date_____

Time_____

Initial

Note: Operators must wear eye goggles or face shields during the well wetting operation.

1. Shut off main heating power via the main circuit breaker remote switch located on the control panel in T-4107. _____
2. Lockout and tagout the main power circuit breaker. _____
3. Enter the controlled area through the man gate near T-4107. _____
4. Attach the well wetting hose to the well head at the quench port valve. _____
5. If continuous wetting is required, proceed to step 6. If only a measured amount of water is required for wetting, proceed to step 7. _____
6. Attach wetting hoses to the gate valve on the well head. Open the valve so that water runs slowly (~0.3 GPM) into the well from the water reservoir. Note: Water hoses from the water reservoirs must not touch one another or other metal conductors on the surface per OSPL-52. Proceed to step 9 below. _____
7. Turn on the water supply first. Open the quench port gate valve on the well head and allow water to enter the well. Flow rate from the fire hydrant is about ~15 GPM. Wet for 5 minutes (~75 gallons). If amperage levels do not balance or the electrode dries out quickly resulting in reduced conductivity, repeat the well wetting procedure with a greater amount of water. Approximate water added: _____
8. **Disconnect** the water supply hose from the well head at the completion of wetting. _____
9. Verify that there is no standing water in the Christy box as a result of the well wetting operation. _____
10. Exit the controlled area through the man gate next to T-4107. Make sure the gate interlock switch is closed. _____
11. Remove lockout and tagout of main circuit breaker. Re-energize the wells via the remote switch located in T-4107. _____
12. Note amperage levels of the wells immediately and hourly thereafter. _____

NES92-386 11-19-92

Electrical Heating Well Wetting Configuration Log

Electrical Heating Well Id Number	Phase Setting	Reservoir ID
HW-GP-105	BΦ	
HW-GP-103	CΦ	
HW-GP-104	BΦ	
GIW-814	AΦ	J-13 Tank
HW-GP-002 Shallow	AΦ	J-13 Tank
HW-GP-002 Deep	AΦ	J-13 Tank
HW-GP-001 Shallow	AΦ	J-13 Tank
HW-GP-003 Deep	CΦ	West Reservoir
HW-GP-003 Shallow	CΦ	West Reservoir
GIW-815	AΦ	J-13 Tank
HW-GP-102	AΦ	
HW-GP-001 Deep	AΦ	J-13 Tank

NES92-391 11-16-92

Electrical Heating Well Configuration Log

Date/Time Start:			
Date/Time Finish:			
Total Hours Running:			
Main Power Voltage Setting:			
Breaker Number	Electrical Heating Well Id Number	Phase Setting	Breaker On/Off
1	HW-GP-105	BΦ	
2	HW-GP-103	CΦ	
3	HW-GP-104	BΦ	
4	GIW-814	AΦ	
5	HW-GP-002 Shallow	AΦ	
6	HW-GP-002 Deep	AΦ	
7	HW-GP-001 Shallow	AΦ	
8	HW-GP-003 Deep	CΦ	
9	HW-GP-003 Shallow	CΦ	
10	GIW-815	AΦ	
11	HW-GP-102	AΦ	
12	HW-GP-001 Deep	AΦ	

NES92-391 11-16-92

Electrical Heating Voltage Change Log

[illegible]

Note: Main power transformer output voltage and under voltage relay transformer input voltage must be the same.

NES92-397 11-4-92

Electrical Heating Interlock Maintenance Checklist

Date	Emergency Kill Switch (T-4107)	West Gate Interlock	North Gate Interlock	East Gate Interlock	Initial
Start of Operations					

Interlocks shall be tested weekly. For interlock testing the electrical heating power circuit will be energized up to and including the main circuit breaker only. Do not energize the well heads for interlock testing.

NES92-388 11-4-92

Lockout/Tagout Log

Item Name or Description	Reason for Lockout/Tagout	Date/Time Applied/Removed	Initial

NES92-390 11-17-92

Steam Injection Boiler Maintenance Log

[illegible]

NES92-394 11-4-92

Steam Injection Well Configuration Log

Technician:	Date:
Well Number	Well Open or Closed
GIW-813 Upper	
GIW-813 Lower	
GIW-814 Upper	
GIW-814 Lower	
GIW-815 Upper	
GIW-815 Lower	
GIW-818 Upper	
GIW-818 Lower	
GIW-819 Upper	
GIW-819 Lower	
GIW-820 Upper	
GIW-820 Lower	

NES92-396 11-4-92

Dynamic Underground Stripping Project-Boiler Operations Log

[illegible]

3-118

[illegible]

Dynamic Underground Stripping Project-Steam Wellhead Operations Log: Page 2

[illegible]

3-119

Effluent Data Log

[illegible]

NES93-013 1-28-93

Well Temperature Log

	Date:				Time:						
CH#	Name	Depth		CH#	Name	Depth		CH#	Name	Depth	
1	Reference	N/A		12	TEP-003 #2	110'		23	TEP-006 #1	130'	
2	Blank	N/A		13	TEP-003 #3	95'		24	TEP-006 #2	110'	
3	TEP-001 #1	130'		14	TEP-003 #4	80'		25	TEP-006 #3	95'	
4	TEP-001 #2	110'		15	TEP-004 #1	130'		26	TEP-006 #4	80'	
5	TEP-001 #3	95'		16	TEP-004 #2	110'		27	TEP-007 #1	130'	
6	TEP-001 #4	80'		17	TEP-004 #3	95'		28	TEP-007 #2	110'	
7	TEP-002 #1	130'		18	TEP-004 #4	80'		29	TEP-007 #3	95'	
8	TEP-002 #2	110'		19	TEP-005 #1	130'		30	TEP-007 #4	80'	
9	TEP-002 #3	95'		20	TEP-005 #2	110'		31	TEP-008 #1	130'	
10	TEP-002 #4	80'		21	TEP-005 #3	95'		32	TEP-008 #2	110'	
11	TEP-003 #1	130'		22	TEP-005 #4	80'		33	TEP-008 #3	95'	
34	TEP-008 #4	80'		45	TEP-011 #3	95'		56	GIW-815 #1	122.5'	
35	TEP-009 #1	130'		46	TEP-011 #4	80'		57	GIW-815 #2	107'	
36	TEP-009 #2	110'		47	BLANK	N/A		58	GIW-815 #3	87'	
37	TEP-009 #3	95'		48	GIW-813 #1	117'		59	GIW-815 #4	Surf.	
38	TEP-009 #4	80'		49	GIW-813 #2	94'		60	GIW-818 #1	131'	
39	TEP-010 #1	130'		50	GIW-813 #3	77'		61	GIW-818 #2	115'	
40	TEP-010 #2	110'		51	GIW-813 #4	Surf.		62	GIW-818 #3	92'	
41	TEP-010 #3	95'		52	GIW-814 #1	131'		63	GIW-818 #4	Surf.	
42	TEP-010 #4	80'		53	GIW-814 #2	115'		64	GIW-819 #1	131'	
43	TEP-011 #1	130'		54	GIW-814 #3	96.5		65	GIW-819 #2	113'	
44	TEP-011 #2	110'		55	GIW-814 #4	Surf.		66	GIW-819 #3	88.6	

Well Temperature Log (Continued)

	Date:				Time:						
67	GIW-819 #4	Surf.		78	H-001 #6	73'		89	H-003 #1	100'	
68	GIW-820 #1	122'		79	H-001 #7	60'		90	H-003 #2	97'	
69	GIW-820 #2	95'		80	H-001 #8	15'		91	H-003 #3	73'	
70	Blank	N/A		81	H-002 #1	100'		92	H-003 #4	60'	
71	Blank	N/A		82	H-002 #2	97'		93	H-003 #5	15'	
72	Blank	N/A		83	H-002 #3	73'		94	H-003 #6	73'	
73	H-001 #1	100'		84	H-002 #4	60'		95	H-003 #7	60'	
74	H-001 #2	97'		85	H-002 #5	15'		96	H-003 #8	15'	
75	H-001 #3	73'		86	H-002 #6	73'		97	Blank	N/A	N/A
76	H-001 #4	60'		87	H-002 #7	60'		98	AMM #1	N/A	N/A
77	H-001 #5	15'		88	H-002 #8	15'		99	AMM #2	N/A	N/A
100	AMM #3	N/A	N/A	111	GIW-813 U	mVolts		122	GIW-820 L	mVolts	
101	AMM #4	N/A	N/A	112	GIW-813 L	mVolts		123	Blank	N/A	
102	AMM #5	N/A	N/A	113	GIW-814 U	mVolts		124	SeaMist #1		
103	AMM #6	N/A	N/A	114	GIW-814 L	mVolts		125	SeaMist #2		
104	AMM #7	N/A	N/A	115	GIW-815 U	mVolts		126	Blank	N/A	
105	AMM #8	N/A	N/A	116	GIW-815 L	mVolts		127	Blank	N/A	
106	AMM #9	N/A	N/A	117	GIW-818 U	mVolts		128	Blank	N/A	
107	AMM #10	N/A	N/A	118	GIW-818 L	mVolts		129	Blank	N/A	
108	AMM #11	N/A	N/A	119	GIW-817 U	mVolts		130	Blank	N/A	
109	AMM #12	N/A	N/A	120	GIW-817 L	mVolts		131	Blank	N/A	
110	Blank	N/A	N/A	121	GIW-820 U	mVolts		132	Blank	N/A	